**Synesthetic Design. The Laboratory of Basic Design as place of experimentation on the intersensory correspondences.**

Authors: Dina Riccò and Silvia Guerini (Politecnico di Milano, Design Faculty), Design Research Unit GaMS (Graphics and Multimodal Systems), directed by Giovanni Anceschi. Email: dina.ricco@polimi.it; silvia.guerini@polimi.it

**Abstract.** This text deals about the theme of intersensory correspondences and synesthesia applied to the communication design. In our daily contact with objects and messages we involves the globality of senses, but we must consider also that our multisensorial behaviour and use of objects is often in opposition to a monosensorial projectuality, which gives an exclusive importance to the visual register only, unconsidering the interactions created with others registers.

These main factors generated the idea to create a fundamental course of design based on the comprehension and control of interactive sensorial dynamics. Actually we are conducting a didactic and research activity (into the Design Faculty at Politechnic Institute of Milan, Italy), with the main purpose to find the right combination between different factors (as shapes, colours, sounds, rhythms, timbres, etc.) in an audio-visual communication that integrate them, giving to the project new intersubjective values.

This poster shows some of these experiences.

**Keywords**

Basic design, Synesthesia, Intersensory correspondence, Multimodal communication.

**1. Synesthetic Design**

To speak about synesthesia applied to design is rather unusual. But all the same, our relation with the ordinary use of objects needs to involve the globality of our senses.

When we use an object, we don't avoid it closing our nose and our ears, but we analyze - not ever consciously - its qualities; not with others registers.

In this context, the study of synesthesia - as a perceptive phenomenon, metaphor and representation, artistic or not, where you have a relation between various registers (Riccò, 1999) - we think it represent a useful support to define interlinguistical elements that maintain an intersubjective value (see figure 1). Also, if it is true that the subjectivity is a peculiarity of synesthetic perception, as we see in the history of synesthesia - in Newton circle of colours the musical note 'do' was red; in the Clavencin Oculaire by Castel, the same sound was blue; in the paint translations by Luigi Veronesi it was violet - for particular compositive factors and visual/auditory elements (shapes, rhythm, texture, vocal sounds, etc.) - as Gombrich said, referring to the luminosity of vocal phoneme (Gombrich, 1965, pp. 450-451) - we can see that there are amazing agreements.

For example, in most of us high sounds suggest clear and angular images. At the opposite, low sounds suggest dark and angular images, etc. (Marks, 1975)

The same associative principle is valid for musical sounds, language sounds, with comparison between sound and its visual correspondence that lies outside the specific aspects of different cultures.

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**Figure 1:** Synesthesia scheme: classing of the typologies of synesthetic manifestations. Overall the sound sensations stimulate the creation of synesthetic translations. The synesthetic translations from colour, shape and movement sensation are more rare (Riccò, 1999)
2. Synesthetic experiences into the Basic Design Laboratory

Similar synesthetic congruences, that you can find very often in phoneme and figures, maybe find in other fields, typical of visual/auditory languages, as into sensations of other registers. You can see in particular the concordance between chromatic and gustative sensations. A poll submitted to a big number of people - made by J. P. Favre and A. November (1979) - shows up how frequently are gustative/chromatic combinations:

- **acid** sensation is represented by yellow-green tones, till olive green
- **sweet** sensation by yellow-orange till red;
- **bitter** sensation by brown-black and violet;
- **salad** sensation by grey-light green till gray-blue sky.

In their book, Favre and November doesn't specified the data of their poll. So we decided to propose - to the students of Visual Communication Laboratory, directed by G. Anceschi and D. Riccò in 1999/2000, at the Design Course of Politecnico di Milano - an exercise about relationship between chromatic and gustative sensations. Here it is the text of the exercise give to the students.

**Visual representation of taste sensation**

Purpose: visual restitution of one of the fourth gustative sensations: sweet, bitter, acid and salad.

Proceedings: realize each work into a box of 20x20 cm large, put it into a A4 format paper, centered and distant 9.2 cm from the top. There are not raffigurative and formal bonds representations maybe abstracts, figurative or ibrid maintaining a unique chromatic dominance.

Technic: collage using every kind of graphics elements (advertising, photography, etc.)

The works analyse - you can see some results in figure 2 - confirm (75%) the Favre and November statistic. Then we noted some other results:

- sweet sensation is most represented with round lines and circle shapes;
- acid and salad sensations with fragmented lines and angular shapes;
- bitter sensation with irregular lines and shapes.

In the same Laboratory other exercises show - by the comparison of all the works of students - which combinations (of shapes, colours, rhythms or timbres) can be shared in an audiovisual animation, in order to find out intersubjectives values (see figures 3-5).

*Figure 2: Examples of exercises on gustative and chromatic sensations. The exercises represent, in order, the following sensations: sweet (red), acid (yellow-green), bitter (brown), salad (light blue).*

Here it is the text of the exercises give to the students.

**Visual translation of sounds events**

Purpose: represent an audio event - considering main aspects as high, intensity, timbre, lasting - so that an external observator can individuate the existing correspondences between audio and visual elements.

Materials: choose one of four audio events and then construct the visual animation. The audio events are: a musica fragment, two sound events with opposite timbric characters, a noise of an object in movement.

Proceedings: use an unique type of geometric shape - bidimensional (triangle, square, circle) or tridimensional (pyramid, cube, sphere) - that can change dimensions, colours and orientation. It can't be deformed. Use of free shapes quantity.

The final work must be an audio visual animation that has the same lasting of the sound sequence. The student can operate only on the visual component.

By one side the comparison of all students works (enclosed in: Riccò 2000) shows up the evidence of the audio visual congruence (for example into rhythm); by the other side, it demonstrate how quality features (as colour of shape or timbre of sound) correspond to subjective values, whereas quantity features (as image dimension or intensity of sound) correspond to intersubjective values.
A research about synesthesia and Design experiment on visual and auditory interferences

This work deals about an experiment of sensoriality at the projectual level (Guerini, 2001); that means to study the reactions of people to different sensorial stimuli in determined conditions, to discover the relations between visual and sound elements in a multimedia project, also analyzing the interferences generated by the combination of specific elements of both categories. Remember that interference means an incongruence relation between two different stimuli belonging to different sensorial registers.

The two principal registers we involved into the experiment are: auditory and visual. We decided to use basic and abstract visual components (that don’t remind to concrete images), with the purpose to increase the legibility and to eliminate shapes ambiguity. They’ve been compared and combined with opposite icon sound elements that reminded to a concrete soundscape (walking on the rough, move water, etc.).

We made this choice to avoid possible predictability of the results, that is when you combine too many similar elements (for example the sound of water and its correspondent representation).

- Parameters. The first step was to examine different physical and perceptive parameters that characterized each sensorial register. We choose some of them in order to simplify our work during the experimentation and to well concentrate our attention on few but precise elements.

   For the visual register we selected: shape, colour, texture, depth; for the auditory register: intensity, duration.

- Experiment. The body of the work consisted in two different tests:

   Test 1: depth and colour-background of image compared with duration of sound.
   Test 2: shape/texture and colour-background of image compared with intensity of sound. (See figure 3)

   We disposed images in couples and each figures was opposite in its features, respect to the other one of the couple; we organized them in five examples for each test, composed of three couples of colours and two couples of black and white (just to test the contrasts).

   Each couple of images had a couple of opposite sounds, about five seconds lasting.

   We examined two groups of participants, each one composed by four people. The first group was made by people who had a particular predisposition to sounds hearing (musicians, composers); the second group was made by the ones who were more sensible to visual and graphic features (artists, designers, architects).

   We submitted the test to each participant singularly; we showed them the series of images we prepared before and then we invited them to listen sounds related to each couple of image, asking them to tell us their impressions. If possible, they had to justify their choice in order to stand out any correspondence or contrast between elements.

- General results. During the test we discovered that most of various combinations in both groups were homogeneous and distinguished into the two classes of participants (each class had homogeneous results).

   Everyone perceived the big gap between features of each couple of sounds.

   Shapes were almost predominating on colour backgrounds. The hearing of sounds was immediately connected to a mental and interior image, event, or memory.

- Specific results.

   Test 1: irregular sounds with low intensity related to round shapes with irregular depth; regular sounds with high intensity related to angular shapes and uniform depth. Colour is
subjective and its choice is different and various among the participants. The strong preference for black and white explains that colour is a sur-plus value independent from shape; moreover the absence of colour allow people to better concentrate on shape features.

Test 2: irregular and low intensity sounds are related to round shapes with regular texture and vice versa. Colour is more important than before, increasing the expressivity of sound, that is more irregular and has a ‘grane’ feature: sounds that are defined ‘roughs’ or ‘fragmented’ are related to dark colours, whereas ‘smooth’ or ‘fluid’ sounds are related to light colours.

- **Conclusions.** In this experience, the sound register took an important perceptive and evocative role; sound is suggestive and remind to multiples informations that activate mind associations, transforming radically the visual message. In addition to the pure perceptive factor, there is the influence of other aspects (physiological, psycological, emotive, cultural and ideological) that are often determinant on the subjectivity of our way to perceive, establishing relations with objects all around us.

**Figure 3:** 5 couples of elementary textures opposed in shapes and colours, and a couple of sounds opposed in intensity and ‘grane’. The first 3 couples of images have coloured backgroud whereas the last two couples are in black and white to make a comparison between colours and non-colours.

### 4. An italian Web site on synesthesia

This web site completely dedicated to synesthesia an the web (since September 2001, at the URL: www.sinestesie.it, even if most of contents are under construction).

The web site - made by the founders group: D. Riccò (scientific responsible), A. Belluscio and S. Guerini (web content editors) - is a part of the Unit of Research GaMS work, directed by G. Anceschi, at the third Architecture Faculty - Design - Politecnico di Milano. The site’s main purpose is to pick up informations about:

1- results of the italian (but not only) research activity on synesthesia, as a confluence of interdisciplinary knowledges (projectul, psycological, linguistic, litterary, esthetic, musical, etc.);

2- a series of synthestic products (into design, multimedia, artworks and so on);

3- a Laboratory, as a place for didactics experiments about the visual-sound field, with attention to audiovisual esthetic research created with digital instruments.

The site represent a place of exchange and interdisciplinary cooperation opened to everyone desire to present its works through the site, specifically oriented to the synesthesia. For informations: info@sinestesie.it

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### Giovanni Anceschi

Icograda Excellence Award 1999. Artist, communication designer, scholar and manager for culture of multimodality. Founder, with Tomás Maldonado and others, of the new Design Faculty at the Politecnico di Milano. Conduces the Communication Design Section of the PhD in Industrial Design and Multimedia Communication. Director of the Design Research Unit "Graphic and Multimodal Systems (GaMS)"

### Silvia Guerini


### Dina Riccò